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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/792,244	03/03/2004	David R. Hembree	3592.10US (97-0321.10/US)	3976
24247	7590	12/14/2004	EXAMINER MITCHELL, JAMES M	
TRASK BRITT P.O. BOX 2550 SALT LAKE CITY, UT 84110			ART UNIT 2813	PAPER NUMBER

DATE MAILED: 12/14/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

**Office Action Summary**

Application No.

10/792,244

Applicant(s)

HEMBREE, DAVID R.

Examiner

James M. Mitchell

Art Unit

2813

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 17 May 2004.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-10 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-10 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- |  |   |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)  | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)   | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152)             |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)<br>Paper No(s)/Mail Date <u>3/3/04, 8/30/04</u> . | 6) <input type="checkbox"/> Other: _____  |

### DETAILED ACTION

This office action is in response to the preliminary amendment filed May 17, 2004.

#### ***Double Patenting***

The nonstatutory double patenting rejection is based on a judicially created doctrine grounded in public policy (a policy reflected in the statute) so as to prevent the unjustified or improper timewise extension of the "right to exclude" granted by a patent and to prevent possible harassment by multiple assignees. See *In re Goodman*, 11 F.3d 1046, 29 USPQ2d 2010 (Fed. Cir. 1993); *In re Longi*, 759 F.2d 887, 225 USPQ 645 (Fed. Cir. 1985); *In re Van Ornum*, 686 F.2d 937, 214 USPQ 761 (CCPA 1982); *In re Vogel*, 422 F.2d 438, 164 USPQ 619 (CCPA 1970); and, *In re Thorington*, 418 F.2d 528, 163 USPQ 644 (CCPA 1969).

A timely filed terminal disclaimer in compliance with 37 CFR 1.321(c) may be used to overcome an actual or provisional rejection based on a nonstatutory double patenting ground provided the conflicting application or patent is shown to be commonly owned with this application. See 37 CFR 1.130(b).

Effective January 1, 1994, a registered attorney or agent of record may sign a terminal disclaimer. A terminal disclaimer signed by the assignee must fully comply with 37 CFR 3.73(b).

Claims 1-10 are rejected under the judicially created doctrine of obviousness-type double patenting as being unpatentable over claims 8 and 9 of Hembree (U.S. Patent No. 6,229,204) in view of Chia et al. (U.S. Patent 6,225,695). Hembree does not disclose a glob top material filling any space between the substrate and die. Chia (Fig. 2) utilizes a glob top material ("underfill material"; 212, 312) filling any space between the substrate and die (Fig. It would have been obvious to one of ordinary skill in the art at the time the invention was made to incorporate filling any space between the substrate and die of Hembree in order to protect the solder balls/bumps of Hembree as taught by Chia (Col.2, Lines 32-34).

***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 1, 3, 4, 6, 8 and 9 are rejected under 35 U.S.C. 103(a) as being unpatentable over Mertol (U.S. 5,909,056) in combination with Block et al. (U.S. 5,137,959).

Mertol (Fig 3) discloses a semiconductor assembly comprising: a substrate (306) having a plurality of circuits (i.e. in contact with balls) on a portion of a surface thereof; a semiconductor die (311) having a plurality of bond pads located on an active surface thereof (i.e. portion in contact with balls) and having a back side surface; a plurality of solder balls (308) connecting at least a portion of the plurality of bond pads of the semiconductor die to at least a portion of the plurality of circuits of the substrate; one of a glob top material (309,310) filling any space between the substrate and the semiconductor die; an thermal interface material (302) contacting at least a portion of the back side surface of the semiconductor die; and a heat sink cap (300) covering the interface, the semiconductor die, the plurality of solder balls, and a portion of the substrate, the heat sink cap contacting at least a portion the interface.

Mertol does not appear to show that the interface is a compliant, adhesive, gel elastomer, cross linked silicone, filled with thermally conductive material.

Block utilizes an interface that is a compliant, adhesive, gel elastomer, cross linked silicone, filled with thermally conductive material (Col. 1, Lines 55-65).

It would have been obvious to one of ordinary skill at the time the invention was made to form the interface of Mertol with a compliant, adhesive, gel elastomer, cross linked silicone, filled with thermally conductive material in order to improve thermal conductivity as taught by Block (Col. 1, Lines 41-45)

Claims 2, 5, 7, 10 are rejected under 35 U.S.C. 103(a) as being unpatentable over Mertol (U.S. 5,909,056) and Block et al. (U.S. 5,137,959) as applied to claims 1, 4, 6 and 9 and further in combination with Chia et al. (U.S. 6,225,695).

Neither Mertol nor Block appears to shoe the heat-dissipating member with fins.

Chia teaches the use of fins (Fig 1A).

It would have been obvious to one of ordinary skill in the art to incorporate fins on the heat-dissipating member of Mertol in order to order to provide greater surface area for cooling as taught by Chai ((Col. 2, Lines 53-55).

### ***Conclusion***

The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Feinberg (U.S. 5,060,114).

The prior art in Feinberg discloses the use of silicone as a thermal interface between an electronic device and heat-dissipating member.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to James M. Mitchell whose telephone number is (571) 272-1931. The examiner can normally be reached on M-F 8:00-4:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Carl Whitehead Jr. can be reached on (571) 272-1702. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).



Jmm  
November 29, 2004



CARL WHITEHEAD, JR.  
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